

first pair of nephropores, which in most leeches open on somite VIII, are carried forward by long ducts to open on the inner surface of the buccal ring, thus resembling the true land leeches (Haemadipsinae). In *D. mexicana*, also, there is evidence that the first and second pairs of nephridia are united and that the buccal outlet serves both. A similar condition in *D. magna* would explain the failure to find nephropores on both VIII and IX.

Genus *Hirudinaria* Whitman

*Hirudinaria javanica similis*, n. subsp.

Fig. 4

*Material examined*.—Four specimens, including the type (U.S.N.M. no. 20644). Collected at Yun Hsien, Yunnan Province, China, by W. L. Jellison, March 16, 1943. One specimen, labeled "Indian Museum, Z.E.V. 4871. Mainma Dist., N. Burma, Chinese frontier," collected by T. Rennie, June 10, 1911, from pool of water in which buffaloes wallow. This specimen was taken with a large number of *H. javanica javanica*, some of which had gonopores in intermediate positions.

*Description*.—Based upon these five specimens, this form is distinguished from typical *H. javanica* Wahlberg by the separation of the gonopores by nine instead of seven annuli, the male pore being at XI  $a2/b5$  (ann. 30/31) and the female at XIII  $b2/a2$  (39/40). In size, form, color pattern, annulation, arrangement of areolae, and other external characters there is complete agreement with typical *H. javanica*, but in a few respects, as in the position of the gonopores, this form seems to pass beyond the limits of variation of typical *javanica*. Among these is the number of sucker rays as counted at the margin, which is 53 or 54 in the specimens of *similis*, while 40 to 48 is most usual in *javanica*. However, this has little significance as some rays are entirely undivided, whereas others bifurcate two or even three times, the last division often appearing close to the periphery of the sucker. The sensillae appear to

be relatively smaller but have the same distribution, elliptical form, and angular deviation from the body axis as in *javanica*. Two specimens dissected differ in respect to the female organs from those of *H. javanica* as described in *Fauna of British India—Hirudinea* (p. 217) in having much shorter oviducts and larger prostate glands. Other dissections of *H. javanica*, however, show variations in both respects partly bridging this gap. The salivary papillae on the jaws of one specimen studied are somewhat more numerous, there being on each side about 19 of the smaller size, mostly in a row close to the dentigerous ridge but a few on the jaw peduncle, and 15 of the larger scattered or in short irregular rows on the sides of the jaws. The former measure 0.029 to 0.037 mm and the latter 0.05 to 0.064 in a specimen of medium size.

The difference in the number of annuli separating the gonopores involves not one but two characters, as the positions of the male and female pores vary independently. In the collection of the Indian Museum are specimens of *H. javanica* in which either of these is shifted from the furrow somewhat into the bounding annuli (Moore, 1922, p. 212), the female pore tending to move to a more caudal, the male to a cephalic position, resulting in intermediates between the two subspecies.

Typical *H. javanica* is abundant in Assam and Burma, and present information indicates that in North Burma there is a tendency for the gonopores to separate more widely and that at the northward limit of the known distribution of the species in the Burmo-Chinese frontier area there is a population in which nine full annuli intervene.

The type of *H. j. similis* is an individual of medium size measuring, in millimeters: length 61, to male pore 13; widths, buccal ring 4.4, male 7, maximum (ca. XV) 11, anus 3.5; depths at same points ca. 3, 2.8, 3.5, 2.3; caudal sucker 7.

ICHTHYOLOGY.—*Anchoviella analis*, a new engraulid fish from the west coast of Mexico.<sup>1</sup> ROBERT R. MILLER, U. S. National Museum.

During the World's Columbian Exposition in Chicago in 1893, the Mexican

Government exhibited representative fishes, mostly from the fresh waters of central and southern Mexico. The specimens were subsequently preserved and donated to the United States National Museum. Among

<sup>1</sup> Published by permission of the Secretary of the Smithsonian Institution. Received May 25, 1945.

the many lots in this collection I found four engraulids which, because of a combination of very distinctive characters, are described below as new.

Genus *Anchoviella* Fowler  
*Anchoviella analis*, n. sp.

Fig. 1

*Generic reference.*—In technical characters this species agrees with the genus *Anchoviella* and the subgenus *Anchoviella* as recently defined by Hildebrand.<sup>2</sup> Gill membranes narrowly attached anteriorly; teeth in jaws small and nearly equal in size; origin of anal fin nearly under that of dorsal fin; more than 15 gill rakers on lower limb of first gill arch; body deep and strongly compressed; anal fin base long; maxillary not reaching joint of mandible (but extending beyond posterior rim of orbit a distance about equal to diameter of pupil) and broadly rounded posteriorly, rather than pointed as in *Anchovia* and *Anchoa*. The size and shape of the maxillary form the principle character by which *Anchoviella* differs from *Anchoa*. Dr. S. F. Hildebrand has kindly examined the types and agrees that the species should be placed in *Anchoviella*.

*Holotype.*—U.S.N.M. No. 131168, a specimen 82 mm. in standard length, collected in Laguna de Mexcaltitan, Nayarit (formerly Territory of Tepic), Mexico.

*Paratypes.*—U.S.N.M. No. 130857, three specimens 60 to 74 mm. long, secured with the holotype and bearing the same data. All the types are somewhat shrunken.

The position of the type locality (shown on the American Geographic Society Map NF 13, Guadalajara, edition of 1940) is approximately 9 miles west-southwest of Tuxpan, which is nearly 39 miles northwest of Tepic. Mexcaltitan is a small settlement near latitude 23° N., longitude 105° 30' W., on an arm of a lagoon which is connected to the Pacific by a meandering channel about 10 miles long. In 1893 this lagoon may have been called Laguna de Mexcaltitan; the original label with the fish read Laguna de Mezcaltitlan.

*Diagnosis.*—A deep-bodied, compressed *Anchoviella*, with a rather long maxillary (but not reaching to joint of mandible), and with a very long anal fin of 31 to 35 total rays (29 to 31

principal rays),<sup>3</sup> the origin of which is almost directly under that of the front of the dorsal fin.

*Description.*—In the following description the measurements and counts for the holotype are given first, followed by those for the three paratypes, in order of decreasing size. The method of presentation is essentially the same as that followed by Hildebrand (*loc. cit.*). The measurements were stepped off with a pair of fine dividers and are expressed as percentages of the various parts indicated, usually estimated to the nearest tenth and occasionally to the nearest hundredth.

Standard length in mm 82 (74, 64, 60); head in standard length 4.3 (4.1, 4.2, 4.2); width of body in its depth (measurement approximate) 4.1 (3.9, 3.8, 4.0); depth of body in standard length (measurement approximate) 4.1 (4.0, 4.1, 4.1); eye in head 3.3 (3.4, 3.4, 3.2); eye in postorbital 1.6 (1.6, 1.7, 1.5); post-orbital in standard length 8.2 (7.9, 8.0, 8.05); snout in head 5.4 (5.3, 5.1, 5.3); mandible in standard length 7.4 (7.2, 7.3, 6.75); mandible in head 1.75 (1.75, 1.65, 1.6); maxillary in head 1.75 (1.75, 1.65, 1.6); dorsal base in head 2.5 (3.0, 2.6, 2.8); anal base in standard length 2.6 (2.7, 2.7, 2.85); pectoral in standard length 5.6 (5.1, 5.45, 5.1); pectoral in head 1.3 (1.2, 1.3, 1.2); pelvic in head 2.5 (2.35, 2.4, 2.3); axillary scale of pectoral in head 2.8 (2.7, 2.65, 2.6); dorsal rays 13 (12, 13, 12); anal rays 35 (33, 35, 31); pectoral rays 12–13 (12–12, 13–13, 12–12); pelvic rays invariably 7; scales (approximate) 40 (39, 40, 38); gill rakers (above and below angle of first arch) 19+24 (19+23, 18+24, 19+24).

Body deep and strongly compressed, the thinness exaggerated by shrinkage. Ventral profile more curved than the dorsal. Head rather short and deep, its depth at joint of mandible about 1.3 to 1.4 in head length; snout short and bluntly pointed, projecting well beyond tip of mandible. Dorsal fin rather high and short, the anterior (longest) rays (broken in holotype) reaching far beyond tip of last ray when depressed, its origin equi-

<sup>3</sup> In the enumeration of principal dorsal and anal fin rays, the first ray counted was the first long, unbranched ray, followed by branched rays; two rudimentary rays invariably precede this ray in both fins. In order to make the counts agree with those in the most recent review by Hildebrand, the total count was used.

<sup>2</sup> Bull. Bingham Oceanogr. Coll. 8 (2): 11–12, 108–109. 1943.

distant between caudal base and some point on pupil; anal fin base long, its origin almost directly under that of dorsal origin and equidistant between caudal base and middle to posterior of pupil; pelvics small, extending more than halfway to anal origin, inserted about equidistant between anal origin and pectoral base; pectorals long, extending slightly beyond insertion of pelvics.

Color of specimens in alcohol dark brown, with a silvery band, which is rather wide anteriorly but narrow between dorsal and anal origins and is very narrow on caudal peduncle; its ventral margin is not clear-cut, but the greatest width of the band is about two-thirds to three-fourths the eye diameter. Rather fine, dark pigment spots on tip of snout, along ridge of back, base of dorsal, and a few along base of anal. Sides of head silvery, with a metallic bluish luster.

*Relationships.*—*Anchoviella analis* differs from any known American species of the genus in the long, many-rayed anal fin and in the anterior position of this fin. In number of anal rays it is closest to *nattereri* (Steindachner), described from Pará, Brazil, which has 28 or 29 (possibly 30 to 31 total rays). The new species differs prominently from Hildebrand's account of *nattereri* (condensed from Steindachner's description) in the much more anterior insertion of the anal fin (origin of anal about under middle of base of dorsal in *nattereri*), much shorter snout (5.1 to 5.3 rather than 4.0 in head), and in having the maxillary bluntly pointed (rather than nearly square) posteriorly. It is obvious that *analis* is not closely related to *nattereri*. Superficial resemblance is seen be-

tween *analis* and *pallida* (Starks), as figured by Hildebrand,<sup>4</sup> but *analis* has much fewer gill rakers (28 to 34+36 to 45 in *pallida*) and more anal rays.

*Anchoviella analis* much more nearly resembles certain species of the closely related genus *Anchoa*, notably *A. panamensis* (Steindachner), known from Mazatlán to Peru. It agrees with *panamensis* in the number of anal rays, the origin of the anal fin, the shape of the head, the compressed body, and the length of the pectoral fin but disagrees on the important character of the length and shape of the maxillary which, in *panamensis*, is slender and pointed and is much longer, 1.2 to 1.4 rather than 1.6 to 1.75 in the head length. The rather remarkable resemblances between *analis* and *panamensis* may be more real than superficial, however, and *analis* might be considered an aberrant *Anchoa*, with an exceptionally short, blunt maxillary. If that view were adopted, however, the principal generic difference between *Anchoa* and *Anchoviella* would fail and *Anchoa* would become a synonym of *Anchoviella*. To base such a move on the few specimens before me seems entirely unwarranted. Differences judged to be of generic value often lose their sharpness in borderline species.

*Associates.*—The following species were found wrapped in the same lot with the new species: *Anchoa macrolepidota* (Kner and Steindachner), *Anchoa lucida* (Jordan and Gilbert), *Diapterus peruvianus* (Cuvier), and a species of *Gobionellus*.

*Etymology.*—The new species is named *analis* because of the very long anal fin base.

<sup>4</sup> *Loc. cit.*, fig. 59, p. 134.

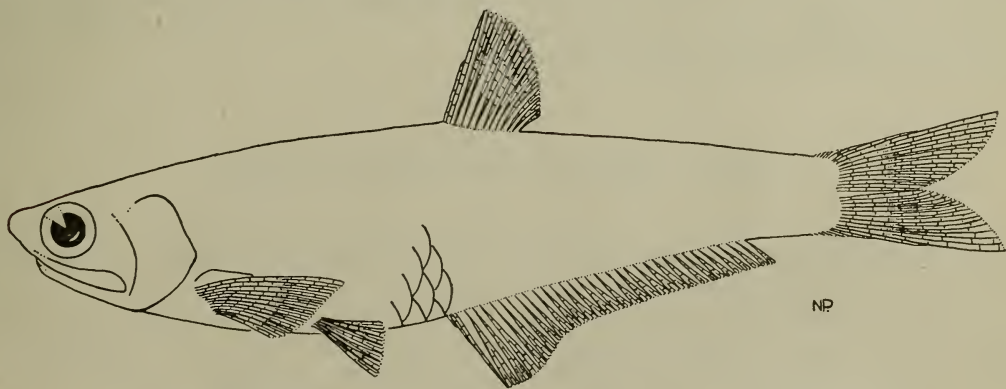


FIG. 1.—Holotype of *Anchoviella analis*, n. sp., U.S.N.M. No. 131168, 82 mm in standard length. Drawn by Nancy Patton.